JPRS: 4704

19 June 1961

MAIN FILE

RECENT NEWS ON THE SOVIET GLASS AND CERAMIC INDUSTRIES

Distributed by:

OFFICE OF TECHNICAL SERVICES
U. S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
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WASHINGTON 25, D. C.

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JPRS: 4704

CSO: 1889-S

RECENT NEWS ON THE SOVIET GLASS AND CERAMIC INDUSTRIES

[Following is the translation of two articles in Steklo i keramika [Glass and Ceramics], Vol 18, No 2, Moscow, February 1961.]

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JPRS:

CSO: 1889-S

IN THE KONSTANTINOVKA AFFILIATE OF THE UKRAINIAN SCIENTIFIC RESEARCH INSTITUTE OF CONSTRUCTION MATERIALS AND STRUCTURES

-USSR-

[Following is the translation of an article by V. F. Kislitsyn in Steklo i Keramika [Glass and Ceramics], Vol 18, No 2, Moscow, February 1961, pp. 42-43]

In 1950, in the town of Konstantinovka, which is one of the major centers of the glass industry in the USSR, there was organized the Affiliate of the Glass Institute. From the moment of its organization, all of the scientific-research work has been carried out in the closest contact with the engineering and technical workers in the Konstantinovka factory "Autoglass" [Avtosteklo]. Furthermore the contacts of the Affiliate with various glass factories have been expanded and a good deal of research has already been carried out in the following factories: the Factories imeni the October Revolution, "Proletariat," Lisichanskiy, L'vovskiy, Gor'kovskiy, etc.

In 1959 on the basis of the Affiliate of the Glass Institute, there was organized the Konstantinovka Affiliate on Glass Structures, which is now part of the Ukrainian Scientific-research Institute of Construction Materials and Structures (NIISMI) in the Academy of Construction and Architecture of the Ukrainian SSR. The type of work in the Affiliate has undergone a fundamental change: instead of three laboratories (the melting and working of glass, the mechanical working of glass and production control) new laboratories have been set up which are: glass plastics, glass fiber, construction glass and a laboratory for chemical analysis.

At present the laboratory for glass fiber is conducting a project for perfecting a method for unbroken production of glass fiber which will be used in glass plastics, glass gaskets for glass concrete and other structures. We have made test forms of glass gaskets with a diameter of 10, 20

and 30 mm, which have been impregnated with urea-formaldehyde resin, phenolformaldehyde resin and epoxy resin. The tensile strength of the gaskets is from 2000-3000 kg/cm^2, and the flexing strength between 2000-2500 kg/cm^2. We intend to perfect the manufacture of glass gaskets from glass derived from rock strata which is found widely throughout the Ukraine. In the near future we plan to study the questions on the use of glass gaskets in concrete, in systems of electric insulators and in other details.

In the laboratory for glass plastics, a method has been perfected for drawing out sheets in thicknesses from 2 to 10-12 mm on the basis of ground up glass fiber and urea-formaldehyde resin. Along with this they are doing research on the adhesion of the resins to the glass. A most important tasks for the laboratory is to make an inexpensive but strong, coating and decorative material for use in construction.

In the laboratory of construction glass we have prepared samples of glass blocks without a bithuminous airtight seal by using metallic frames, that is, aluminum and steel.

The Glass factory imeni the October Revolution has given great assistance to the workers of the laboratory. In the near future they intend to test the glass blocks which have been manufactured under factory conditions on items of new construction.

Research is also being conducted on several theoretical questions. The scientific workers in the Affiliate, O. V. Guzhavin and V. A. Dubrovskiy, have conducted a serious study of the chemical strengthening of glass.

In the Affiliate a method has been worked out for determining the potash in loose materials with the aid of radioactive substances. In order to introduce this method into production they have constructed and are now testing a measuring block which consists of the beta-counter "STS-6." They have also worked out a method for a rapid analysis of sodium-potash mixtures. The time required for determining the components now does not exceed 3 or 4 hours instead of 2 or 3 days.

In cooperation with the workers of the Lisichanskiy Glass Factory of the Luganskiy Sovnarkhoz, a group of scientific workers under the direction of V. I. Khmelevskiy has worked out the technology for preparing high aluminous blocks on mullite bundles for the basin of water heaters.

In cooperation with the Popasnyanski Factory work is being carried out on the increasing of productivity in automatic glass forming machines.

The Affiliate has given technical assistance to a number of enterprises in the glass industry and to scientific-research organizations such as the Glass Factory imeni the October Revolution, the Slavyanskiy Central Scientific-Research Institute for Insulators, the Artemovskiy Glass Factory, the Lisichanskiy Glass Factory, etc.

In order to establish closer creative ties with the enterprises of the glass industry, we intend to improve the structure of the Affiliate so that the requirements of the factories are met more satisfactorily. In the near future we intend to organize new laboratories (on the automation and mechanization of technological processes, and techno-economic research), to complete the thermotechnical group, and the group dealing with waste products. We intend as well to concentrate greater attention on the solving of technological questions which concern the manufacture of structures for various purposes.

DISCUSSION OF PROGRESSIVE METHODS FOR ENRICHING CERAMIC RAW MATERIALS

-USSR-

[Following is the translation of an unsigned article in Steklo i Keramika, Vol 18, No 2, Moscow, February 1961, pp. 46-47.]

The Moscow Administration of the All-Union Chemical Society imeni D. I. Mendeleyev held in Moscow a conference on the progressive methods for enriching ceramic raw materials.

In the introductory speech by the Chairman of the section on Fine ceramics, I. A. Bulavin, stressed the importance of supplying the ceramic factories with enriched fine-ground conditioned raw materials. By centralizing the supply of conditioned fine-ground raw materials, the work of the mass-producing plants is simplified and work space is freed in the actual plants, and in those plants which are still under construction the amount of construction and installation is lessened. The supplying of conditioned raw materials leads also to an increase in quality and lowers the net price of the products.

At the conference 25 reports were given and discussed.

G. P. Filintsev (GIKI*) and the chief engineer of the Dulevskiy China Factory, A. K. Orlova, outlined the basic needs which occur in the fine ceramic factories for kaolin, soft clays, and for quartz and feldspar materials.

N. F. Olofinskiy (Institute of Mining of the Academy of Science, USSR) reported on the new directions in the field of separating the ceramic raw materials. The speaker reported that the means for enriching the raw materials which are presently available do not always provide effective separation of the individual minerals or their complexes. At present in the ceramic industry the new electrical methods of separation have not found the needed application. These methods are widely used for enriching, classifying and for dust removal in the ores of ferrous, nonferrous and rare metals, and also in many other minerals.

In the near future it is necessary to create the conditions for the successful application of crown, triboelectric and other methods for separating the ceramic raw materials according to chemical composition and density. The structural layout and the principle of action in the

[* GIKI = Gosudarstvennyy issledovatel'skiy keramicheskiy institut, the State Ceramics Research Institute.]

electroseparators which are adaptable for this purpose enable them to be included in the technological scheme of the enterprises in the ceramic industry.

The director of the VNII* for carbon enriching, M. G. Akopov spoke on the theoretical research in the study of the effect of the hydrocyclons for enriching useful minerals. He reported that they have been working on the experimental determining of the peripheral speed of the current flow of a liquid under various parameters of the hydrocyclon. They applied a method of changing the pressure in corresponding spots with the aid of a hydrometrical "Prandtle" pipe and a differantial manometer with the subsequent calculation of the speed increase. In the Institute with the aid of radioactive isotopes, they measured the speed of movement of the hard particles with a specific gravity of 1 g/cm^3; they measured the speed of movement of the hard particles with a specific gravity of 2.6 g/cm^3 of differing density with the aid of photoelements. As a result of the experimental studies on the speed of current flow of liquids and of hard particles in the hydrocyclon (and as well in industry tests on determining the influence of the basic sizes and construction of elements in th e hydrocyclon on the effectiveness of the process of separation,) they worked out a method for calculating the hydrocyclones.

V. A. Mevtina spoke on the work which had been done in the field of enriching ceramic raw materials in the Institute "NIIStroykeramika" [All-Union Scientific Research Institute of Structural Ceramics]. In the Institute they tested a method of hydrocycloned enriching of kaolin without the application of electrolytes. They established the optimum parameters for the work of a hydrocyclon with a diameter of 70 mm: the amount of hard substance in an initial suspension should not be higher than 30-32%, the pressure in the feed pipe 2-4 at., the density of granules in an initial material not higher than 1.0-1.5 mm. The productivity of the tested hydrocyclon under the pressure of about 2 at. is about 600-650 kg/hr, but by raising the pressure to 4-5 at., it reaches 900 kg/hr.

"NIIStroykeramika" recommended the following improvements in the technology of dry enrichment of kaolin: the replacement of the drying drums with conveyor dryers, and the replacement of the large bulk cyclons with multicyclons, and also the use of electrofilters for catching the fine particles of kaolin.

The speaker reported that in the aim of finding an abundant feldspar raw material they made a study of granite, alaskite and nepheline syenites. There are large deposits

[*VNII = Vsesoyuznyy nauchno-issledovatel'skiy instrumental'nyy institut; All-Union Instrument Scientific Research Institute.]

of this raw material in the Kola Peninsula, in Karelia, in the Ukraine, the Urals and in Siberia. The enormous reserves of granite and the permanency of its composition allows for the organization of mechanical extraction. Tests have shown that semi-procelain masses which contain enriched granite and alaskite according to ceramic standards do not differ from the masses which contain pegmatite.

In the report of I. I. Popova, which was read by the Chairman of the Glass Institute, it was reported that the enriched granite, alaskite, miascite, nepheline syenites and anorthosite can be used also as a glass raw material. The technological scheme which has been worked out for enriching feldspar rock includes crushing, the removal of dust and electromagnetic separation in a strong magnetic field.

The research which has been carried out on the enrichability of glass raw materials and the technical capacity for enriching substances permits one to conclude that it may be possible to transfer the glass industry to enriched raw materials. This will expand the raw material base and raise the general level of mechanization for working the raw material.

The studies on the feldspar resources in various deposits permits one to recommend the exploitation of a number of new deposits. In the first place one might propose the construction of a crushing and enriching plant at the Leznikovskiy granite quarry; the plant should supply the glass and ceramic factories of the Ukraine, Belorussia, and also partially the central oblast's of the RSFSR with high-quality feldspar raw materials.

D. I. Frantsuzov (Institute of Mechanical Instruments) reported on the enriching of pegmatite in the Lagoda and Murman areas /"rayons"/; S. M. Kupfer (The Ural Geological Administration) spoke on the experience in enriching and the prospective industrial uses of alaskite from the Rezhik deposits.

Taking part in the discussion of the reports were: Comrades Salov (Leningrad Institute of Design and Planning for Metal Working), Ivakhin (TsNIIL [Tsentral'nyy nauchno-issledovatel'skiy institut lamp=Central Scientific=Research Institute for Lamps] of the Ministery of Electric Power Stations), Revnivtsev (The Ural Mechanical Instrument Plant), Kazakevich (Gosplan, USSR), Povarov (Mekhanobr [Scientific Research Institute for Mechanical Concentration of Minerals]), Vasyutinskaya (NIIStroykeramika), Churbanov (Karel'skiy Sovnarkhoz) and others.

In the decisions taken at the conference, it was noted that in order to supply the ceramic factories with conditioned and crushed raw materials it is necessary to build in various economic regions of the country highly mechanized enriching factories. The work of such factories should be planned on the most progressive methods for enriching which permit the mechanization of the process and the production of inexpensive, high-quality products.

The decision of the conference contains a list of undertakings which are necessary for the most rapid carrying out of the work for improving the enriching of kaolin, soft clay, quartz and feldspar raw materials, and also for the planning and manufacture of equipment for grinding and enriching plants.

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